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worth $\frac{3}{4}d.$ more than a pound of good sawginned Dhárwár and $1\frac{1}{4}d.$ more than a pound of good-fair Kumta; at present a pound of American Mid Orleans (November 1883) is worth $1\frac{5}{8}d.$ more than good sawginned Dhárwár and $1\frac{1}{8}d.$ more than good-fair Kumta.

Besides cotton the chief Belgaum exports are brassware, grindstones, grain, butter, and cloth. Of brassware the chief articles are brass lampstands or *samais*, small water-sipping ladles and cups or *pali panchapátris*, small round god-boxes or *sampushtas*, waving lamps or *niránjans*, and other articles used in worship. These are made by the Otari casters of Gokák and sold at Gokák to dealers from Kolhápúr, Dhárwár, and Hubli. Grindstones are made at Arbhavi in Gokák by masons or Pátharvats, and taken for sale in carts or on pack asses to Poona, Sátára, and Dhárwár. Rice wheat millet and gram, molasses, and tobacco are bought from the Lingáyat, Jain, Marátha, and Musalmán growers by the trading carriers and traders of the market towns, and sent to Kaládgi, Dhárwár, Goa, Vengurla, Rájápúr, Sirsi, and sometimes to Bombay. Clarified butter is bought from Marátha Lingáyat and Jain husbandmen either in their own villages or in market towns on market days, and is sent in tin boxes by a few Nárvekar dealers to Bombay by Vengurla. Of cloth, *sádís* or women's robes are best woven at Belgaum, Gokák, and Báil-Hongal, and *dhotars* or waistcloths at Belgaum and Báil-Hongal in Sampgaon. Robes waistcloths and other coarse cotton cloth are generally bought from the weavers by the local traders and either locally sold to Goa, Rájápúr, and other Konkan traders or sent for sale to Dhárwár and Kaládgi. Myrobalans or *hirdás* are sent in large quantities from Belgaum. They grow wild in the forests of Khánápúr, Belgaum, and Chikodi, and are gathered for the forest officers during the fair season and kept at Government stores where they are sold to contractors. The contractors send the myrobalans to Vengurla where they are sold to agents of Bombay and European merchants.

There has of late been a considerable increase in the import of European cotton yarn and cloth, boots and stockings, and among articles of house furniture clocks, watches, glasses, ornamental chairs, and tables. These articles are used by the well-to-do, especially by those who have received an English education. Kerosine oil and matches are largely imported and are used by all except the poorest.

III.—INDUSTRIES.

Industries.

The chief Belgaum crafts are cotton-ginning, cotton spinning and weaving, calico-printing, dyeing, toy-making, copper and brass work, pottery, and oil-pressing.

Cotton-ginning.

One of the chief industries of the district is the ginning of cotton, that is the separating of the cotton wool from the cotton seed. Though the practice is greatly neglected, the cotton should be dried before it is ginned. If it is not dried the fibre is stained or otherwise harmed. To dry it the cotton is spread in the sun and is frequently turned so that every part of it, especially the seed, may be thoroughly dried. Seed-cotton or *karpás* is not in good order for ginning unless the seed cracks, and does not crush between the teeth of the gin. Cotton cannot be rightly ginned in wet or even in damp weather. A

short smart shower unless followed by a steady dry wind will stop cotton-ginning for days.

Each landholder is careful to put on one side part of his best local cotton for home spinning. This is ginned separately and with much more care than what is meant for sale. The quantity set apart for home spinning depends on the number of women in the household and the leisure they have for working the spinning machine or *nalu-rati*. For home-spinning the staple is so well cleaned that not a single seed can be found in a dozen pounds. Three machines are used for ginning cotton, the ginning wheel or *charkha*, the foot-roller or *hattigudda*, and the sawgin. The ginning wheel or *charkha*, though still found in a few remote villages in the north of the district, has for many years been discarded in favour of the foot-roller. The ginning wheel is a very rough machine. It consists of two cylinders, one of wood the other of iron, which revolve on endless screws at the ends of rollers. The cylinders, which are twenty to twenty-four inches long, are fixed touching each other, parallel and horizontal, in a strong wooden frame twelve to sixteen inches high. The iron cylinder which works on the wooden cylinder is about half an inch in diameter. It is thickest in the middle and tapers slightly and gradually towards the ends. The wooden roller is much thicker. It is one and a half to two inches in diameter, and on one end has a rude wheel sixteen to twenty inches in diameter fixed on the centre. A piece of wood stuck in the rim of the wheel serves as the handle for working the roller. On the other side of the ginning wheel, at the end of the iron roller, is a second handle for turning it. When in work, the ginning wheel is fixed on the ground between two persons, each of whom takes a handle and turns it in an opposite direction, and by turns feeds the wheel with seed cotton. The seed is turned out on one side and the wool on the other. Nothing but cotton is cleaned in the wheel. It turns out more work than the foot-roller, but does not work so well. The cost of ginning with the wheel is about half-way between the cost of ginning by the saw gin and by the foot-roller.

The chief local appliance for ginning cotton is the foot-roller called *hattigudda* in Kánarese. The foot roller is a rude primitive machine which does not cost more than 1s. (8 as.). Its chief parts are the *tevantghi* that is the three-legged stool on which the ginner sits worth 2d. (1½ as.); the *aru-kul* or flat-stone about one foot by six inches and two inches thick worth 3d. (2 as.); the *kuda* an iron roller about one foot long and tapering from about three-quarters of an inch in the middle to a point at the ends worth 6d. (4 as.); and two wooden soles or *pavantgis* for placing under the feet when turning the roller, generally made of flat pieces of split bamboo costing little or nothing. The foot-roller is worked only by women and girls. In cleaning cotton by the foot-roller the seed cotton is laid in the sun, frequently turned, and when well dried is sharply beaten with a thin bamboo called *shedi* that it may be as loose as possible for ginning. When a heap of cotton is ready the ginner sits on her three-legged stool. She sets the stone on the ground before her and on

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the stone lays the iron roller whose ends stand about three inches beyond the side of the stone. On each end of the roller she sets one of the bamboo soles. She leans forward still sitting but partly balancing herself on her feet which she rests on the bamboo soles at the ends of the roller. She takes a handful of seed cotton in her right hand and pressing with her feet on the bamboo soles moves the roller back and forwards on the stone. As the roller moves she drops seed cotton under it and the pressure of the roller on the seed cotton separates the wool from the seed. The seed comes out in front and the cotton wool comes out behind. As the cotton wool comes out the ginner keeps pulling it under her stool with her left hand.

The rates for cleaning with the foot-roller vary in different places. The following are perhaps about the commonest. The owner of the cotton or the owner's man, serves the seed cotton to the women in a body. As each woman brings her cleaned cotton back, it is weighed and she is paid at a rate equal to about 3s. 4d. (Rs. 1 $\frac{1}{8}$) the hundredweight of ginned cotton. Another plan is to serve seed cotton to each woman, and pay her by the weight of the seed cotton. In this case the rate represents about 3s. 3d. (Rs. 1 $\frac{5}{8}$) the hundredweight of cleaned cotton. On the other hand, if they wish the cotton to be really clean and free from seed or dirt the woman is paid by the amount of seed and dirt she takes out of the cotton at rates which represent a charge of about 4s. 4 $\frac{1}{2}$ d. (Rs. 2 $\frac{3}{4}$) a hundredweight. The system of having two ginning rates, a high rate to ensure clean cotton for the local spinners and a low rate to ensure dirty cotton for the Bombay buyers, prevails over the whole district. If honestly worked the foot-roller cleans local cotton better than any other machine. It is the only machine that does no harm to the fibre. At the same time the process is very slow. This slowness is a serious evil as the local cotton cannot be ginned in time to reach Bombay before the rains, and by being packed in leaky godowns and dirty sheds loses much of its value.

Saw-ginning.

The outturn of American Belgaum is now so trifling that few sawgins are used and these few are in bad repair. Most of these sawgins have ten to eighteen saws. The machine is worked by the hand in a room eighteen feet by fifteen. The room is divided into two spaces separated by firm bamboo matting. Of the two spaces the smaller about twelve feet is used as a lint room, and the larger is set apart for the gin. The gin must be firmly placed against the partition of the smaller room. In the partition-matting a hole should be cut of the size of the gin-flue and the flue should be placed in the hole and passed two or three inches beyond it. The small or lint room should not be too air-tight; if it is too air-tight the flue gets choked and hinders the working of the gin. The gin must be perfectly level as well as firm. It must be so firmly secured either by strong pegs or masonry that while at work it remains perfectly still. The smaller strap should then be put on the inner and larger rim of the saw pulley, and over the top of the brush pulley; this will make the brush pulley move inwards, that is in the opposite direction to the saws. The band must be fixed round the wheel

of a pulley post at the back of the gin and tightened by a rack fastened to the pulley post. Care must be taken that the fans or brushes keep the flue clear of ginned cotton, and at the same time raise enough draught to drive the ginned cotton twelve or fourteen feet. If the fans are not properly arranged, the ginned cotton will gather close to the mouth of the flue, and stop the gin. The spindle of the driving wheel must be placed eighteen feet from the saw pulley, and the wheel should be placed in a line with the gin so that the strap or band may run freely and smoothly. The band should have holes in its joining ends so that it may be tightened or slackened at will. When the band is arranged the wheel should be firmly fixed, so that it may work with perfect steadiness. Five workers are wanted, four drivers at the wheel and one to feed the gin. The feeder places a quantity of seed-cotton on the top of the machine, and with his back to the driving wheel stands opposite and close to the gin, facing the hopper-box which receives the seed-cotton and in which the saws revolve. Experience is wanted to make a good feeder, so that the roll of the cotton in the hopper-box may revolve equally and steadily. At starting it is well to fill the hopper with a mixture of equal parts of seed and seed-cotton. The feeder should then lift the box on its hinges, high enough to keep the saws clear of the mixture in the hopper. Then the drivers should begin and as soon as the gin is in motion, the box should be put down sharply, evenly, and firmly. The working of the saws forces the contents of the box to go round, and the feeder must keep on supplying cotton neither too slowly nor too fast. The roll or contents of the box should move steadily with the hopper full, but not overcharged. If the roll of cotton in the box does not begin to go round as soon as the saws are in motion the box should be lifted once, or if necessary twice, and be again carefully set down in the way described. This lifting will also be necessary every now and then to clear the box of the cleansed seed that may gather at the bottom of the grates. In fine bright weather, for damp at once injures ginning, an eighteen-saw gin in good work will in an hour gin one hundredweight of seed cotton. In starting and working a gin care must be taken that the saws revolve through the cotton only, and that they do not rub against the grates. To make sure of this the hopper should be allowed to become empty or almost empty, and, with the hand resting on the saw whirl, the saws should be made to revolve slowly. If any of the saws gives the slightest touch to the sides of the grates, the adjustment is wrong. The saws are easily put right by seizing the saw in a pair of plyers or pincers and working it until it is seen to revolve in the exact centre of the space between the grates. If all the saws press on one side, the whole of them and the spindle are wrong, and to put them right the spindle must be properly replaced on the bearings. Unless these adjustments are made the fibre will be damaged. Every time that the saws are examined, the seed board must be carefully replaced, or the seed will either fall too freely and not properly stripped of the wool, or, if the opening is too small, the seed will not fall away at all and the gin will be stopped. The seed board is easily replaced by the travelling nuts that are fitted for the purpose. Every care should be taken that the cotton seed is free

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from stones, lumps of earth, or other matter likely to injure the teeth of the saws. The gin should be kept carefully clean and all its bearings well oiled. Of the three modes of ginning the sawgin is much the most rapid. An eighteen saw-gin driven by four men and fed by a fifth will turn out twenty pounds of clean cotton in less than half an hour. Two men working a wheel gin or *charka* turn out about twenty pounds of clean cotton in twelve hours. The foot-roller works still more slowly. Ginning with the foot-roller costs about half as much again as ginning with the saw-gin, and the cost of the wheel gin is about half-way between the cost of the foot-roller and of the saw-gin.

The arrangements for working saw-gins vary greatly. The richer dealers often employ their own staff of men so that it is not easy to calculate what the ginning costs them. When the owner of the seed cotton has neither a gin nor his own men he commonly gives 694 pounds of American seed cotton to five labourers four of whom drive and one feeds the gin. These men are bound to give the owner 482 pounds of ginned seed and the 212 pounds of cotton wool. For this they are paid 4s. 6d. (Rs. 2½) which is about 2s. 4½d. (Rs. 1½) the hundredweight of clean staple. The charge for the use of a gin varies from 2s. (Rs. 1) the 694 pounds of cotton seed in the slack season to 4s. or 6s. (Rs. 2-3) in the busy season. The nominal outturn of clean cotton is 212 pounds in 674 pounds. This is much above the actual outturn and to bring the weight of clean cotton to what is required the labourers have to add weight. To increase the weight of the clean cotton they let as much dirt as they can pass among the clean cotton and with this object always prefer to use gins which are out of order. A saw-gin in really good order if honestly worked, gives much less than 212 pounds of good clean cotton wool from 694 pounds of the present poor and mixed American. Mr. E. P. Robertson, when Collector of Dhárwár (1868-1875) brought to notice that gin-owners kept their saw-gins unrepaired for years till the teeth of the saws were almost worn away. Saws worn to knives cleaned more cotton and cleaned it more easily than when the saws were fresh. The fact that saws worn to knives cut the cotton into masses of fluff made no difference to the gin owners.

Though the saw-gin is intended only for American cotton, it is often used in the Kánarese districts for ginning the local staple, especially when the local cotton has been dulled or soiled by rain or has been beaten down on the ground. With the foot-roller it is impossible to give damp and dirty local cotton anything like a good appearance so the holder passes it through a saw-gin, which freshens it and makes it look better. The dealer generally does his best to pass this sawginned local cotton as sawginned American, and those who do not know sawginned American are often deceived.

A serious objection to the general use of the saw-gin is the difficulty of keeping the teeth of the saws in order. Many experiments have failed because the teeth of the saws were either badly shaped or were too sharp. The tooth should be a not too blunt hook, in shape much like a rose thorn. As the saws move

round in the hopper, the tooth catches the fibre. To do its work properly the tooth must be sharp enough to catch the fibre and blunt enough to hold the fibre without in the least cutting it. If the tooth is too flat or blunt it will catch the cotton and crush it, and often the seed as well, in lumps against the grates of the gin. If the brushes or fans are in proper order, they sweep off the fibre as soon as the tooth has laid hold of it. If the brush does not sweep off the fibre, the fibre is carried round back into the hopper, and the tooth, blocked with the fibre, forces its way through the seed cotton doing much harm. To keep the teeth at the proper sharpness and curve Mr. Walton (1865-1880) found it necessary to make a special file. Every workman who filed the teeth had the model of a perfect tooth with him and was told to file the tooth to the shape of the underpoint of a man's little finger. Many American planters object to bran-new saw-gins. The planters take off the roughness of fresh teeth by working them for a little with cotton seed and sand.

The following is a summary of the efforts which have been made to introduce the use of saw-gins into Belgaum. Saw-gins were brought into India as early as 1828. In 1828 one of two Whitney saw-gins sent by the Court of Directors to the Bombay Government was forwarded to the Bombay Karnátak for trial. So long as the saws were under skilled European control and care they worked well. But all officers agreed that it was unsafe to trust them to cotton-growers or cotton dealers. The mistake was at first made of ginning the local cotton in the saw-gins. In many cases the result was that the cotton was cut to pieces. In fact the saw-gin is suited only to New Orleans cotton, whose fibre clings so tightly to the seed that the ordinary gin cannot separate it. In 1835, Lord Ellenborough, President of the Board of Commissioners for the Affairs of India, suggested that specimens of the machinery used in cleaning cotton in America, Brazil, India, and Egypt, should be sent to London, and that Indian seed cotton should be sent with the gins that experts might determine which was the best machine. A foot-roller and a wheel-gin were sent by Dr. Lush from Belgaum. In 1836 to encourage the cotton trade, the Bombay Government abolished the 5s. 6d. (Rs. 2½) tax on wheel gins. This measure did not much affect Belgaum. In 1838 Dr. Lush condemned the American Whitney gins. He said much time had been lost by assuming that because the machine did well in America it must do well in India. He added that a gin was wanted which would do the same for India that the Whitney gin had done for America. On this the Court of Directors offered a prize of £100 (Rs. 1000) to encourage mechanics to invent a gin suitable for Indian cotton. The result was unsatisfactory. Saw-gins were first made in the Karnátak about 1845. Nearly at the same time, with the aid of local craftsmen, Mr. Mercer the American planter succeeded in making a saw-gin in Dhárwár and Mr. Channing in Belgaum. The local saw-gin though somewhat imperfect worked fairly so long as it was under skilled supervision and management. Under every other condition it failed. As the number of local saw-gins increased, it was found impossible to keep wooden framed gins in repair.

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They were also found unsuited for permanent use by the husbandmen. No matter how well seasoned the wood and excellent the workmanship, they fell to pieces under the rough treatment of the gin owners and their servants. In the towns and villages the local saw-gin was never successful till every possible part of it was made of the strongest iron. Even iron gins are so roughly used that it takes the most constant efforts to keep them in anything like good order. When he has bought a saw-gin, the local dealer thinks he has done all he should be called on to do, and that his first expense should be his last. He does not understand that saw-gins want keeping up to the mark. So long as it can go round, he is most unwilling to spend even the smallest sum to keep his gin in repair.

In 1844 some cotton dealers objected to the saw-gins because the cotton they turned out was too clean. About the same time the Collector reported that the cotton dealers at Bâil-Hongal and Saundatti, had applied that saw-gins might be put up in their towns. The Collector was allowed to grant their request and Mr. Channing set up the gins in some old Government buildings at the cost of about £20 (Rs. 200). In the same year (1845) Government set up two more saw-gins one at Murgod and another of fourteen saws on the Government farm at Nâgenhâl. Except the gin on the Government farm these saw-gins were let to local dealers. To encourage careful picking the ginning charges were 2s. (Re.1) for 756 pounds (twenty-seven *mans*) of well picked and 672 pounds (twenty-four *mans*) of ordinarily picked seed-cotton. Mr. Channing represented that, if the price of saw-ginning was brought within the means of the local merchants, he believed saw-gins would come into general use throughout Belgaum. He asked to be allowed to make two machines at a cost of £19 16s. (Rs. 198) each, which, he added, was about half the price at which such gins could be procured from England or America. Early in 1847 these proposals were sanctioned.

Mr. Channing estimated that he could make and issue twenty good saw-gins at about £16 16s. (Rs. 168) and good twenty-five saw-gins at about £17 8s. (Rs. 174) and at ten per cent less if more than six were made at one time. These machines could be made and fitted on the spot, except the saws, which must be brought from England. So long as these gins were under direct European management and were mended and adjusted by skilled mechanics, they answered their purpose well. They ceased to work well when they were taken to dealers' ginning houses, and subjected to rough and ignorant usage. A machine fitted for such rough treatment was never made until every part of it was made of strong iron. Even the iron gins went wrong if workmen were not constantly going round with inspectors after them to see not only that the workmen mended the gins properly, but that the gin-owners allowed them to mend them. Later in the same year (1847) the available saw-gins were found to be too few. To increase ginning facilities the Bombay Government—applied to the Court of Directors for 5000 saws for new gins. Only four saw-gins were kept on Government account and during the season one of these was sold for £22 (Rs. 220).

Sixteen more were being made for Government and for private persons. In the same year the cost of cleaning American cotton by the saw-gin was 5*d.* ($3\frac{1}{2}$ *as.*) for eighty pounds, and the cost of cleaning local cotton by the foot-roller was 6*d.* ($4\frac{1}{2}$ *as.*) for eighty pounds. In 1848 the demand for saw-gins spread in some of the neighbouring states. Government suggested that prizes should be offered to the local craftsmen for the best saw-gin. Mr. Simpson, the superintendent of cotton experiments, opposed this suggestion. The native craftsmen had much skill in imitating, but, without training, they could not make a machine that required such nicety and exactness as a saw-gin. He thought no one should be allowed to sell saw-gins who had not spent six months in the Government factory.

In the same year in consequence of the representations of the Honourable Mr. Reid twelve hundred new saws were received from England in Belgaum. Even this did not meet the demand. About this time some of the sawginned cotton sent to England was found to be damaged; it was said because the gins were worked at too great a speed. There was some difference of opinion among experts as to the best number of revolutions in the minute. All agreed that hand labour, which implied slow turning with occasionally extremely fast spurts, was bad for the staple. In 1852, to improve the ginning machinery and to settle the disputed point regarding the best rate of speed, Government determined to hold a public trial in Calcutta and offered a prize of £500 (Rs. 5000) to the maker of the best gin. Mr. Channing, who had at first said that the best rate was 180 turns in the minute, afterwards raised his estimate to 200 or 250 turns a minute. The Dhárwár superintendent thought even a higher rate than 250 turns was advisable. Opinions still differ as to the best rate of speed.

Early in 1849, at the suggestion of the Manchester Commercial Association, the Court of Directors sent out 200 cottage saw-gins. Great pains were taken with this handy machine. No less than four models were made; one chiefly of wood, the rest of iron. Each was worked on a different plan and all were made under the advice and suggestions of those who were well acquainted with India and its cotton trade. Dr. Forbes Royle who was present at the trials, thought the gin made of iron with saws and brushes moved by wheels and bands the best. He recommended that it should be introduced into India chiefly on the ground that if each landholder had one of these handy machines in his house, he would be independent of other labour, and his family would gin his cotton crop. He thought there would not be much difficulty in introducing the gin, as it could be no novelty in Belgaum and other districts where the people were already acquainted with sawginning. The iron model was farther improved, and the Court of Directors ordered two hundred to be sent to India. It was calculated that with this small machine one man would be able to gin sixteen pounds of seed-cotton in the hour at an expense of less than 6*s.* (Rs. 3) for five hundred pounds of cleaned cotton, while the hand-power gins at work were found to turn out for each man less than one pound an hour, at an expense of nearly 8*s.* (Rs. 4) for five hundred pounds of clean staple, and the old Indian wheel-gin cleaned

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fifty pounds of seed-cotton a day at a cost of 10s. (Rs. 5) for every five hundred pounds of clean cotton. It was estimated that the cost of wear and tear, to every bale of cotton cleaned by these three machines, was for the cottage gin a little over 1s. 4d. (10½ as.), for the saw-gin about 1s. 8d. (13½ as.), and for the Indian wheel gin a little over 6d. (4 as.). A number of the cottage gins were distributed in Belgaum and Bijápur. They were worked for a time, were never repaired, and in the end were thrown on one side as lumber. In Mr. Walton's opinion these cottage gins did not get a fair trial. When worked by skilled Europeans, as by Dr. Wight in Madras, these cottage-gins succeeded well. With eight of them Dr. Wight ginned about 4000 pounds of cotton; if he had had them Dr. Wight could have kept 200 gins at work. Even with a fair trial Mr. Walton doubted if the cottage gins would have answered in Belgaum. They would be roughly used and get out of order and there was no means of putting them right if they once went out of repair.

In 1850 the demand for saw-gins in Belgaum was at its greatest height. Forty were at work in twenty-one towns and villages and orders for thirty-seven were registered. In the same year (1850) the Collector of Belgaum calculated that ginning with the foot-roller cost 12s. to 14s. (Rs. 6-7) and with the saw-gin 7s. (Rs. 3½) the *khandi*. About the same time Mr. Channing calculated that with the saw-gins then in work in Belgaum, with an assistant, he could clean about 1,200,000 pounds of raw or seed cotton, and without an assistant about 700,000 pounds of raw cotton a year. To meet the great demand for saw-gins it was arranged that ten Government saw-gins should be sent from Dhárwár and that small machines should be made which could be sold to landholders for 16s. (Rs. 8). It was hoped that the people would buy the small machines and keep them in their houses; and that this would remove one of the main objections to the growing of New Orleans cotton. These efforts ended in failure, as these small cheap gins were unsuited to stand the rough and ignorant treatment they received. Up to this time it does not seem to have been noticed that to saw-gin the local cotton in the same way as the American did it incurable harm. The demand for gins which was so brisk in 1850 soon passed away. In 1851 of twenty-six Government gins only five were at work and of fifty-six private gins only twenty-two were at work. This collapse seems to have been partly due to the failure of the American crop and partly to faults in the gins. Mr. Davis, the first European agent in Belgaum, took twenty-five of the Government gins, but returned them as he found they did not work well.

About 1851 the Bombay Government sent to Belgaum some cotton cleaning machines, designed and constructed by a Mr. Mather, for which he had received a prize of £50 (Rs. 500) and the Bengal Agricultural Society's Medal. Captain, afterwards Sir George Wingate, the head of the Southern Marátha Revenue Survey, who had paid particular attention to cotton cleaning machinery, tested the Mather gin and pronounced it a poor adaptation of the native wheel-gin and inordinately dear at £8 (Rs. 80). In this opinion all officers who tried the Mather gin agreed. In 1852

of fifty Government saw-gins only two were at work and of thirty-nine private saw-gins only thirteen were at work. In 1855 Mr. Reeves brought to notice the damage done by saw-gins in bad order. The landholders and local dealers of Dhárwár and Belgaum looked solely to the quantity of cleaned cotton they could turn out in a day. They were reckless as to the way in which the cotton was cleaned; they worked their saw-gins so long as they could be kept going. In 1856 when the orders of the Court of Directors to stop cotton experiments reached Belgaum the Government ginning houses were valued at about £712 (Rs. 7120). The order stopping experiments was modified as regarded saw-gins as it was found that no one but Government could supply them. The damage done by careless ginning, of which Mr. Reeves complained, proved so serious that some new machines of the best quality were ordered. The new machines were carefully distributed in Dhárwár, but in Belgaum and Bijápúr little was done. To keep the cotton-ginning machinery in repair apprentices, all of them Indo-European youths were (1857) trained under the superintendents.* Some of the apprentices learned well, but none stuck to the work as all found better-paid employment. Government sold the English-made gins at £40 (Rs. 400) for an eighteen and £20 (Rs. 200) for a ten saw-gin complete including the driving gear. The machines were of the best class and were always put up and thoroughly tested before they were made over to purchasers. During the American War (1862-1865) immense numbers of gins were imported and made in the country.

In 1866 and 1867 Mr. Walton, the superintendent of Government cotton ginning, established repairing factories at Navalgund and Ron in Dhárwár. As these factories were near the Belgaum and South Bijápúr frontiers they were entrusted with the gins of those two districts. The factories were much used till, in 1870, Mr. Walton left for England, and it was arranged that the Dhárwár factories were not to mend gins beyond Dhárwár limits. Since then the Belgaum and Bijápúr saw-gins have fallen more and more out of order, until the people have almost ceased to grow American cotton because they have no machinery to clean it with. So far as is known only about thirty saw-gins are left in the district. Of the thirty, twenty-eight are in seven villages of Parasgad and two are at Báil-Hongal a large village in Sampgaon. Of these thirty gins few are in use, partly because of the want of means for repairing them. The price of gins which during the American war was as high as £120 (Rs. 1200) now ranges from £5 to £8 (Rs. 50-80).

No Belgaum cotton is either full-pressed or half-pressed. In 1847 Mr. Channing devised a cotton-press at an estimated cost of £8 (Rs. 80) which the Collector said could be made and put up by any local mechanic. Mr. Channing was allowed to set up this press in the town of Saundatti. Many other attempts have been made to introduce the use of presses. All have failed. The failure has been due partly to the difficulty of keeping the machinery in order, but chiefly because the exporters cannot trust the local dealers. The exporter knows that when opportunity offers, the up-country ginner

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